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BY THE COMPTROLLER GENERAL

# Report To The Congress

OF THE UNITED STATES

## Federal Agricultural Research Facilities Are Underused

Many of the Agricultural Research Service's 148 domestic research locations are not staffed to their designed capacity. Service scientists use about 73 percent of that capacity and other Federal and State scientists use an additional 10 percent. Meanwhile, new facilities are under construction or are being planned which, when completed, will make the overall use rate even lower unless personnel and funding levels are significantly increased--an event not likely to occur.

GAO recommends that the Department of Agriculture develop and submit to the Congress for review and comment a plan to consolidate research activities at fewer locations, thereby allowing greater scientist interaction and more efficient use of resources. Also, because the Congress has directed the Department to assess long-range agricultural research needs, the Congress should consider not authorizing any additional research facilities until the Department has completed its planning process and the Congress has had an opportunity to study these plans. Further, when the Congress deliberates on any proposals for new facilities it should consider requiring certain personnel and facility information from the Department.



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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON D.C. 20548

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To the President of the Senate and the  
Speaker of the House of Representatives

This report discusses the underuse of Federal agricultural research facilities operated by the Department of Agriculture's Agricultural Research Service. It identifies the reasons for the underused capacity and discusses the benefits that could be realized from fewer research locations. We made this review because of concern about the underuse of research facilities and its effect on ongoing research.

We are sending copies of this report to the Director, Office of Management and Budget, and to the Secretary of Agriculture.

*Charles A. Bowsher*

Comptroller General  
of the United States



D I G E S T

The U.S. Department of Agriculture's Agricultural Research Service operates a network of 148 domestic research locations, many of which were not staffed to their designed capacity--a condition which makes individual research projects more expensive. With continued hiring and funding constraints, Service research activities could be more effective and efficient if they were conducted at fewer locations with a larger concentration of scientists.

Because of congressional and Department concerns about the underuse of these research facilities, GAO made this review to (1) determine why facilities were not fully used, (2) evaluate the Service's past actions to improve use, and (3) explore ways to further improve facility use. (See pp. 1 to 3.)

As of October 31, 1981, the Service had research space to accommodate about 3,275 scientists; however, only about 72 percent of the space was used by Service scientists. An additional 10 percent was used by non-Service scientists. The percentage of use at individual facilities varied greatly--from over 100 percent of designed capacity to as low as 17 percent of capacity. This underuse has resulted primarily from a declining personnel ceiling and construction of new facilities. (See pp. 4 to 17.)

Despite the underuse of existing laboratories, new laboratories are under construction and others are being planned. These additional facilities could further reduce the overall rate of use because the Service's personnel ceiling is not expected to rise in the foreseeable future. Furthermore, indications are that staffing for new laboratories may be at the expense of existing ones. (See pp. 9 to 17.)

To fully use its existing research facilities the Service would require a substantial increase in its annual appropriations and higher personnel ceilings--something that is not likely to happen considering today's projected Federal budget cuts and growing deficits. (See p. 4.)

The Service has closed some facilities and transferred staff to other locations to improve facility use. However, the Service told GAO that this approach has not been very successful because individuals and groups affected by the closings pressure the Service to keep the facilities open. As a result, some facilities were still operating that would have been discontinued with the resources redirected to higher priority research. (See pp. 17 and 18.)

The Service has tried other ways to improve facility use. It has leased or otherwise provided research space to other Federal or State agencies. Some locations have been better used because of the non-Service scientists working there. Also, the Service has improved use with support personnel, and at times scientists, hired under cooperative agreements with State agricultural experiment stations. These methods have helped, but other actions are needed. (See pp. 18 to 21.)

#### PLANNING FOR THE SYSTEMATIC CLOSING OF RESEARCH FACILITIES

With continued hiring and funding constraints, Service research activities could be more effective and efficient if they were conducted at fewer locations with a larger concentration of scientists. GAO found that:

- Scientists need to interact with enough other scientists to promote idea exchange and problem solving. As of October 31, 1981, the Service had 31 research locations which had 10 or fewer scientists each and were not located near other agricultural research institutions where interaction could occur.
- Fewer locations with a greater concentration of scientists could make more efficient use of scientific and other equipment and specialized buildings. Larger facilities are also better able to justify employing technicians to operate the specialized equipment. Currently, some scientists at small locations use research time to develop these skills.
- A network of fewer research locations should require fewer area offices and less administrative support and overhead. (See pp. 22 to 30.)

As part of the administration's directive to all civil departments to identify low priority

activities for elimination, the Service has developed plans, still under internal discussion, to close up to 12 research facilities. Those plans, however, are designed to cut back on the Service's lowest priority research, but were not based on a comprehensive review of underused facilities. More needs to be done. (See pp. 29 and 30.)

Long-term planning and good justification for closures are necessary before research laboratories can be closed. Because of past opposition to some of the Service's proposed closings, it is important that the Congress have an opportunity to review and comment on the plan before implementation. (See p. 29.)

#### RECOMMENDATIONS TO THE SECRETARY OF AGRICULTURE

GAO recommends that the Secretary of Agriculture develop a plan to consolidate agricultural research activities at fewer locations, thereby allowing greater scientist interaction and more efficient use of resources, and submit the plan to the appropriate committees of the Congress for their review and comments. (See p. 32.)

#### AGENCY COMMENTS AND GAO EVALUATION

In its comments (see app. IV), the Department of Agriculture said that the Service was developing a strategic plan as a basis for future research management. It said that the implementation and operational plans to support the strategic plan should be an excellent basis to assure consolidation of research and permit greater scientist interaction for more efficient use of resources.

The Department said that in view of its experience with congressional sources objecting to past actions taken to close laboratories, GAO's recommendation that plans for closing laboratories be submitted to the Congress for review and approval was not realistic. The Department said that executive branch responsibility should be allowed to proceed normally in decisions to close facilities in the course of program administration, which includes congressional involvement during the appropriation process for major closures.

GAO understands the concerns expressed regarding congressional approval of the plan. It has modified the recommendation to more clearly state

its intent. GAO believes that because of the past difficulties experienced in individual closings, congressional support needs to be obtained for a comprehensive plan for improving the overall use of research facilities. Therefore, as a minimum, the plan needs to be submitted to the Congress to use as a basis for ensuring congressional understanding of the plan's strategy and the ramifications of altering portions of the plan to satisfy concerns from locally affected individuals and/or organizations. (See p. 32.)

#### FUTURE RESEARCH FACILITIES

The use of Service research facilities will not improve if new facilities continue to be constructed at the same time the personnel ceiling is declining and laboratory closures are thwarted. Under these conditions, the use situation can only deteriorate. (See p. 33.)

New facility construction or major expansion of existing space should be tied in to long-range research goals and objectives. Development of implementation and operational plans to support a strategic plan that the Service is currently developing as a basis for future research management should provide a clearer understanding of Service goals and objectives. This effort began in December 1981 in response to GAO's July 1981 long-range planning report (see p. 33) and a December 1981 Office of Technology Assessment study (see p. 2.). The GAO report included legislative language to require the Secretary of Agriculture to develop, in conjunction with the agricultural community, a long-term needs assessment for food and fiber and to determine the research necessary to meet those needs. Similar language was included in the Agriculture and Food Act of 1981 (Public Law 97-98), which was enacted in December 1981.

These plans, when completed, should provide useful information to the Congress for making funding decisions on new facilities.

#### MATTERS FOR CONSIDERATION BY THE CONGRESS

Given the currently underused research facilities, the unlikely prospects for personnel ceiling increases for the Service, and the congressional mandate to conduct a long-range needs assessment and determine the research necessary to meet those needs, the Congress should consider not

authorizing or providing funds for additional research facilities until the Service has completed its planning process and the Congress has had an opportunity to study those plans. In the future, as the Congress deliberates the need for any additional research facilities, the plans, if periodically updated, should be helpful in determining whether available Service facilities are adequate, or could be modified or expanded at a reasonable cost, to carry out the needed research.

Further, when the Congress entertains proposals for new facilities, it should consider requiring the Service to promptly provide it with (1) an inventory of possible unused or underused non-Service facilities that could be modified to meet the research needs and information on the cost of such modifications, (2) information on the feasibility of having non-Service scientists do the needed research, and (3) information on how the research will be staffed if personnel ceilings prevent the hiring of new personnel for the facility, so that it can consider the information fully during deliberations. (See pp. 33 and 34.)

#### OTHER AGENCY COMMENTS AND GAO EVALUATION

The Department said that the report correctly states that many Service laboratories are not staffed to their designed capacity but that it does not adequately emphasize (1) the effects of political and economic considerations that shape agricultural research programs or (2) the adverse effect on program needs if planning is centered on the use of space. GAO understands the political and economic factors involved and believes that they are discussed in the report. GAO believes that the matters for congressional consideration presented above reflect these factors and are necessary to increase the prospects for better future use of Service research facilities. In addition, GAO agrees that planning centered solely on the use of space would not be appropriate. It is for this reason that GAO is recommending that the Department develop a plan that considers the political and economic factors discussed in chapter 3. (See p. 34.)



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ABBREVIATIONS

ARS	Agricultural Research Service
GAO	General Accounting Office
OMB	Office of Management and Budget
OTA	Office of Technology Assessment
USDA	U.S. Department of Agriculture

CHAPTER 1

INTRODUCTION

The U.S. food and agricultural research system is built around (1) the U.S. Department of Agriculture's (USDA's) Agricultural Research Service (ARS) which focuses on agricultural problems of regional, national, and international concerns, (2) the State agricultural experiment stations which focus on local and regional problems while carrying out State university educational programs, and (3) the food and fiber industries which generally perform proprietary applied research and development.

ARS' budget has grown to the point where it has almost a half-billion dollar program proposed for fiscal year 1983. Program obligations for fiscal years 1981 to 1983 are as follows.

<u>Fiscal year</u>	<u>Amount</u>
1981	\$434,015,000 (actual)
1982	464,320,000 (estimated)
1983	493,548,000 (estimated)

In commenting on the report (see app. IV), USDA's Acting Assistant Secretary for Science and Education said that despite the increase in dollar resources, ARS has had to reduce staff numbers and research programs because of the decline in the purchasing power of the dollar.

To accomplish its mission, ARS operates research facilities in 148 domestic locations, including 8 major national laboratories of which 4 are regional research centers.

The Congress has expressed concern about the underuse of Federal research facilities, including agricultural research facilities. In 1974 and 1978 the House Committee on Appropriations released studies by its Surveys and Investigations Staff on the use of Federal laboratories. The studies were initiated because some members of the Congress believed that many departments and agencies had not fully explored the possibility of better using the underused or vacant space in existing Federal laboratories before requesting funds to construct new facilities. The Surveys and Investigations Staff in its 1978 study said that ARS used about 78 percent of its research facilities' capacity.

Similar concerns about the low use of agricultural research facilities were discussed during hearings on USDA's fiscal year 1979 appropriations before the Subcommittee on Agriculture, Rural Development, and Related Agencies, Senate Committee on Appropriations. The Secretary of Agriculture said that Federal expenditures for construction needed to be held to a minimum and that existing facilities should be fully used before any new construction was started. Also, the Assistant Secretary of Agriculture for Conservation, Research, and Education said that construction of new

facilities combined with declining staffing levels would require that USDA's scientific resources be spread more thinly.

In a December 1981 report, <sup>1/</sup> the Office of Technology Assessment (OTA) observed that ARS had more field locations than were needed to carry out effective national and regional research within present fund limitations and personnel ceilings. The OTA study, however, did not include an assessment of what portion of the designed scientific capacity of ARS laboratories was not being used or what could be done to increase use.

The use rate of facilities can become important because the costs of maintaining a research facility are relatively fixed regardless of whether the facility is fully staffed. Doing research at a facility that is not being used to capacity will be more costly than research done at a well-used facility because the research projects underway at the underused facility will have to absorb the fixed costs.

#### OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives in this review were to identify the principal reasons why Federal agricultural research laboratories were underused, to evaluate actions taken to improve their use, and to explore ways to further improve laboratory use rates. We visited ARS headquarters, its 4 regional administrative offices, 5 of its 14 area administrative offices, each of its 4 regional research laboratories, 2 recently constructed laboratories, and 21 other laboratories in various parts of the United States. (See apps. I and II for the names and locations of the laboratories and offices we visited.) We toured the laboratories and discussed with ARS officials steps taken to improve use. We also discussed various alternatives that could be used to increase the use of existing laboratory space.

The review was made in accordance with generally accepted government audit standards. We reviewed applicable congressional hearings on facility authorization and use and coordinated our work with OTA. We interviewed ARS management officials in Washington, D.C., and the field and reviewed ARS reports, memorandums, and documents. We also interviewed a USDA personnel specialist about staffing levels and personnel ceilings in ARS.

We relied on information from ARS data systems for many of the research laboratory use and cost statistics used in this report. We verified use information when we visited specific laboratories.

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<sup>1/</sup>"An Assessment of the United States Food and Agricultural Research System," Office of Technology Assessment, Dec. 1981.

We visited laboratories and offices to obtain the views of ARS management officials and laboratory scientists and evidence to help us form conclusions about the principal causes of laboratory underuse and the alternatives available for improving laboratory use rates. We did not evaluate the quality or effectiveness of completed, ongoing, or planned research projects.

Because of congressional and local interest in laboratory establishment and use, we visited laboratories and offices in each of the four ARS regions to obtain a broad geographic coverage and a cross section of views regarding laboratory use. We also considered such matters as use rate--both high and low; size--both large and small; location--both remote and on university campuses; and the kinds of research performed.

We did not compute the potential cost savings or improvement in research effectiveness from any specific alternative that may be available to improve the laboratories' use. To do so would be impractical for this review because of the variables involved--research priorities, capabilities and interests of individual scientists, and adequacy of facilities. Each analysis would have to be made on a case-by-case basis.

We made most of our visits between October 1981 and late March 1982. During our visits to ARS headquarters and regional and area offices, we obtained information on laboratories in addition to those we visited. This information is also discussed in this report and was used in forming our conclusions.

## CHAPTER 2

### UNDERUSED RESEARCH CAPACITY--

#### A GROWING PROBLEM REQUIRING JOINT

#### CONGRESSIONAL AND DEPARTMENTAL ATTENTION

ARS used its federally owned and leased laboratory space at only about 73 percent of its rated capacity as of October 31, 1981. However, use of some space by non-ARS scientists raised the overall use rate to 83 percent. The use rates of individual research facilities varied considerably from well over 100 percent of rated capacity to as low as 17 percent. The underused research facilities included larger as well as smaller laboratories and newer as well as older facilities. This underuse resulted primarily from a declining personnel ceiling and construction of new facilities.

Despite the underuse of existing laboratory space, new laboratories are under construction and others are being planned. These additional facilities could further reduce the overall use rate because ARS' personnel ceiling is not expected to rise in the foreseeable future. Furthermore, indications are that staffing of new laboratories may be at the expense of existing ones. Moreover, ARS believes that it is extremely difficult to close or consolidate existing research facilities because of local industry pressures to keep them open.

To fully use its existing research facilities, ARS would require a substantial increase in its annual appropriation and higher personnel ceilings--something that is not likely to happen in today's environment of projected Federal budget cuts and growing deficits.

#### ARS--AN EXPANDING NETWORK OF RESEARCH FACILITIES

As of October 31, 1981, ARS operated laboratories at 148 locations in 46 of the 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. These laboratories were in buildings owned or leased by ARS or other Federal agencies or in space principally owned by the various States. At the 148 locations, ARS owned or leased 126 research facilities and had 17 laboratories in facilities owned or leased by other Federal agencies. In addition, at some of the locations ARS used non-Federal laboratory space--principally at State agricultural experiment stations or branches. ARS also operates research facilities in several foreign countries, but we did not include them in our review.

The number of ARS-owned or -leased research facilities has increased since the late 1950's. Since 1960, 46 ARS-owned or -leased research facilities have been opened. Also, three laboratories, including one expected to cost more than \$30 million and

designed to accommodate a research staff of at least 50, were under construction at the time of our fieldwork.

Many of these newer research facilities do research in similar areas. According to 1978 testimony before the Subcommittee on Agriculture, Rural Development, and Related Agencies, Senate Committee on Appropriations, 18 laboratories involved in air, water, or soil conservation research have been built since 1958. Since the 1978 testimony at least one additional laboratory engaged in soil and water research has opened. It was authorized in 1978 and opened in 1981. At least 8 of the 19 facilities were underused as of October 31, 1981.

ARS' investments in facilities are significant. For example, for fiscal years 1971 through 1982, the Congress appropriated over \$90 million to construct specific research facilities--some entirely new and others to expand or replace existing facilities. That amount does not include the cost of constructing certain structures, such as headhouses, 1/ which ARS has authority to construct without specific congressional approval, subject to certain dollar limitations. The amount also does not include the costs of new equipment, which are significant. For example, ARS' fiscal year 1983 budget documents reflect the following equipment costs.

<u>Fiscal year</u>	<u>Amount</u>
1981	\$26,675,000 (actual)
1982	30,246,000 (estimated)
1983	32,416,000 (estimated)

UNDERUSED LABORATORIES--A PERSISTENT  
AND WORSENING PROBLEM

ARS annually requires a report of the research staff for each of its field locations as of October 31. The report includes information on current research capacity and occupancy and whether space is ARS-owned/leased, other federally owned/leased, or other space. The 1981 reports indicate that ARS had 2,937 scientists plus 335 scientists from other agencies using research facilities with a rated capacity of 3,846, or a use rate of about 76 percent considering only ARS occupancy and about 85 percent considering total occupancy. Non-ARS scientists, for the most part, are scientists from other USDA agencies, such as the Animal and Plant Health Inspection Service, and scientists from State agricultural experiment stations.

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1/At one time a headhouse was a simple facility connected to a greenhouse to store supplies. In recent years some elaborate headhouses have been constructed that include laboratories and conference rooms. However, the Congress has taken actions to control such expenditures.

Our interest for the most part was limited to the use of ARS-owned or -leased research facilities. This space had a rated scientific capacity of 3,275 as of October 31, 1981. At that time ARS had 2,403 of its own scientists using the space, or about 73 percent of the rated capacity. There were also 317 non-ARS scientists, or about 10 percent of the rated capacity, in ARS-owned or -leased facilities which resulted in a total occupancy rate of 83 percent. As noted below, the use rate has been declining.

Date	Rated capacity (note a)	ARS occupancy		Total occupancy	
		Number of scientists	Percent of capacity	Number of scientists	Percent of capacity
Sept. 30, 1977	3,359	2,611	78	2,952	88
Sept. 30, 1978	3,425	2,592	76	2,923	85
Dec. 31, 1979	3,432	2,538	73	2,815	82
Oct. 31, 1980	3,274	2,411	74	2,784	85
Oct. 31, 1981	3,275	2,403	73	2,720	83

a/Differences in year-to-year totals are essentially the net result of upward and downward adjustments of the capacity of some facilities and the addition of new facilities.

In commenting on this report, USDA's Acting Assistant Secretary for Science and Education said:

"Increasingly complex research requires costly and complex research equipment and procedures that have very demanding requirements for space. Not uncommonly, isolation from other activities must be provided and the environment carefully controlled. This has brought about the need for more space per scientist. Some locations have taken this into consideration and have adjusted downward the design capacity of existing facilities to be realistic in light of the present research activities. Continued review of space requirements with adjustments to reflect current activities should result in more accurate space utilization data."

We considered this condition during our review and, as a result, used the most recent data available. However, the underuse of facilities remains a significant problem.

ARS occupancy of the federally owned or leased facilities varied somewhat by region from 70 percent for the Southern Region to 76 percent for the Northeastern and Western Regions. When considering total occupancy by region, the rate varied from 80 percent for the Southern Region to 86 percent for the Western and Northeastern Regions. As the table on the following page shows, 78 of the federally owned or leased research facilities were less than 80-percent used in terms of their scientific capacity as of October 31, 1981, when considering use by ARS

scientists only. When considering total scientific occupancy, including non-ARS scientists, 55 of the federally owned or leased research facilities were less than 80-percent used.

<u>Percent of use</u>	<u>Number of facilities</u>	
	<u>ARS use only</u>	<u>Total scientific use</u>
Under 50	15	9
50 to 59	20	14
60 to 69	25	16
70 to 79	<u>18</u>	<u>16</u>
Total	78	55
80 to 89	22	28
90 or more	<u>43</u>	<u>60</u>
Total	<u>143</u>	<u>143</u>

### Congressional concerns

The underuse of Federal research facilities, including agricultural research facilities, has been a concern of congressional committees at least since 1972. This concern has resulted in the two studies (see p. 1) made by the Surveys and Investigations Staff, House Committee on Appropriations, at the request of the Committee's Subcommittee on Agriculture, Rural Development, and Related Agencies.

The first study was Government-wide and was initiated in 1972 after it became apparent to the subcommittee that many departments and agencies had not fully explored the possibility of using underused or vacant space in existing Federal laboratories before requesting funds to construct new facilities. The March 1974 report cited examples of underuse, overbuilding, and duplication of facilities and stated that these deficiencies were the result of the absence of a Government-wide system of review, coordination, and control to ensure efficiency and economy of operation.

The second study initiated in July 1977 indicated that ARS was using its research facilities at about 78 percent of capacity. The report also indicated that although ARS had 13 fewer laboratories in September 1977 than it did in June 1973 (the time of the earlier study), ARS had increased its laboratory space by almost 1 million square feet--an increase of about 20 percent.

Section 1462 of the Food and Agriculture Act of 1977, enacted September 29, 1977, required a comprehensive assessment of agricultural research facilities. This assessment was to include recommendations for a program to provide the United States with the most modern and efficient system of research facilities needed to advance agricultural research in all fields.

The survey was made by the Joint Council on Food and Agricultural Sciences <sup>1/</sup> at the Secretary of Agriculture's invitation. The survey, made during the winter of 1978-79, was done by questionnaire and covered USDA agencies (ARS and the Forest Service) and those institutions authorized to receive USDA funds for research facilities (State agricultural experiment stations, the colleges of 1890 and Tuskegee Institute, forestry schools, and colleges of veterinary medicine). The respondents were asked to relate facility needs to research programs in three situations, as follows.

1. Facility needs as of September 30, 1977. (This was the latest year for which such data was available when the request was made.)
2. Facility changes completed or in progress as of September 30, 1981, assuming a constant level of support using fiscal year 1979 appropriations as a base.
3. Facility changes completed or in progress as of September 30, 1981, assuming a 20-percent increase in the level of support.

The Joint Council's January 1981 final report confirmed the large amount of underused Federal research space. The report indicates that as of September 30, 1977, the research facilities of the two Federal organizations (ARS and the Forest Service) were staffed under capacity. Excess space in ARS was 522 scientist years and in the Forest Service, 95 scientist years. This excess was projected to increase to 638 for ARS and to decrease to 70 for the Forest Service by 1981, assuming no change in the funding level. Conversely, the State organizations had an overall deficit of 965 scientist years of office and laboratory space as of September 30, 1977, that was projected to increase to 1,048 by 1981. However, the report states that, unfortunately, excess space in Federal facilities does not meet the States' needs because of differing geographic locations and because of the facilities' design limitations.

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<sup>1/</sup>The Joint Council on Food and Agricultural Sciences was established by the Secretary of Agriculture under authority of the Food and Agriculture Act of 1977 to foster and coordinate research, extension, and higher education in the food and agricultural sciences. The Joint Council was composed of representatives from USDA; the Office of Science and Technology Policy; the land-grant colleges and universities; State agricultural experiment stations; State cooperative extension services; and those colleges and universities and other private and public institutions, producers, and representatives of the public that are interested in and can potentially contribute to the formulation of national policy in the food and agricultural sciences.

The Joint Council also examined the facility needs of 50 specific research programs based on funding levels at that time. The examination results showed somewhat different needs than previously discussed. It showed a need for additional Federal space for 133 scientist years--mostly for the Forest Service--and additional space for 1,110 scientist years for the State organizations at a cost of about \$7.7 million for the Federal agencies and \$94.2 million for the State organizations. The Joint Council also identified significant needs to renovate existing facilities and to provide ancillary structures, repair and maintenance, and equipment and instrumentation. These costs were estimated at \$152 million for the Federal facilities, including about \$111 million for ARS and \$544 million for the State organizations.

The Joint Council also made projections for the 50 specific research programs, assuming a 20-percent increase in the funding level, and identified additional costs of \$56 million for Federal facilities and about \$221 million for the State organizations.

The Joint Council recommended to the Secretary of Agriculture that a 5-year implementation plan to improve the physical plant for U.S. agricultural research capability be developed and initiated immediately. According to an ARS program manager, USDA had not requested funding to implement the Joint Council's recommendation at the time we completed our review because USDA officials did not have any hope of getting funds to carry out these recommendations in the existing fiscal environment.

#### REASONS FOR UNDERUSED RESEARCH FACILITIES

The underuse of ARS' research facilities has resulted from a number of factors but principally from a declining personnel ceiling and the construction of new research facilities. The latter includes completely new facilities as well as expanded/remodeled existing facilities. ARS does not expect the personnel situation to improve in the foreseeable future. New research facilities under construction and others in the planning or proposal stages could make the underuse situation worse. Also, ARS usually experiences difficulty when it attempts to close research facilities or to move research programs to other locations. ARS attributes this to local pressures to keep the facilities open.

#### Declining personnel ceiling

ARS has been operating under a tight personnel ceiling for years, and USDA and ARS officials have testified to that fact during annual appropriation hearings.

During Senate hearings on 1979 appropriations, the Secretary of Agriculture testified that USDA was under a tight ceiling and had been even before his time. During the same hearings, USDA's Assistant Secretary for Conservation, Research, and Education

said that in recent years a shift had occurred from in-house research to a greater reliance on both university and other non-Federal research institutions--a situation that developed primarily for two reasons. The first was the desire of that administration, as well as the previous one, to hold down Federal employment. The other was the difficulty of starting new research with sole dependence on in-house funding. He said that since 1971, ARS' permanent, full-time staff had been reduced from just over 9,000 to the 8,100 proposed in the 1979 budget.

During fiscal year 1981 appropriation hearings, the Director of USDA's Science and Education Administration acknowledged that several facilities were less than fully used due primarily to fiscal and personnel constraints. He also said that USDA was considering relocating personnel, where feasible, to more fully use major facilities but that in many cases such relocations or redirection of staff and resources would further dilute the program at smaller but critically needed locations.

In Senate Report No. 97-248 on USDA's 1982 appropriations, the Committee on Appropriations expressed its concern about the effect that continued reductions in personnel ceilings were having on research and, in particular, on USDA's ability to replace scientists who were retiring from several critical research projects.

Also, a USDA personnel specialist told us that ARS' personnel ceiling had been reduced over the years. Further, he said that ARS had to manage against a possible 10- to 12-percent cut during the first quarter of fiscal year 1982. He also said that a hiring freeze had existed during most of 1981 and that during the freeze any new hires were made on an exception basis. According to the personnel specialist, the personnel ceiling would continue to go down and new facilities would be staffed at the expense of existing facilities.

Congressional concern about the use of a Federal research facility as reflected by additional appropriations to improve the staffing does not necessarily mean that the research facility will become well used. For example, the Appalachian Fruit Research Station, Kearneysville, West Virginia, was designed for a scientific staff of 25 and was completed in 1978 at a cost of about \$5.5 million. During fiscal year 1979 appropriation hearings, the Assistant Secretary for Conservation, Research, and Education testified--about the time the Kearneysville facility was to be accepted from the contractor--that only one scientist had been allocated because ARS had neither the money nor the personnel ceiling to bring more staff on board. During the same hearings, USDA's Director of Economics, Policy Analysis, and Budget testified that USDA had neither the funds nor, more importantly, the positions to make effective use of its laboratories. Subsequent testimony brought out also that ARS was competing with other USDA agencies that had mandatory programs for personnel within USDA's overall ceiling.

The House Committee on Appropriations, during the fiscal year 1980 appropriation process, said that it was essential that the Kearneysville facility be fully staffed and proposed a total appropriation of \$521,000, an increase of \$250,000 over the budget request. The conference agreement provided \$1,371,000 as the Senate proposed instead of the \$521,000 the House proposed to staff and equip the Kearneysville facility.

During the fiscal year 1982 appropriation process, the Senate Committee on Appropriations recommended \$3,212,000--an increase of \$800,000 over the \$2,412,000 the House recommended--for the Kearneysville research facility to provide for five additional scientists and other related costs. The conference agreement included \$3,112,000 for Kearneysville--which was included in ARS' appropriations.

The following table shows that the Kearneysville research facility, since its completion in 1978 through October 31, 1981, was used only to about half its designed scientific capacity.

<u>Date</u>	<u>Capacity (scientist years)</u>	<u>Number of scientists assigned</u>	<u>Percent used</u>
Dec. 31, 1979	25	10	40
Oct. 31, 1980	25	<u>a/11</u>	44
Oct. 31, 1981	25	<u>a/12</u>	48

a/Includes one non-ARS scientist.

According to ARS' Acting Regional Administrator, Northeastern Region, Kearneysville had not been fully staffed at the time of our visit because of the personnel ceiling limitation. However, he believed that the facility would get additional staff this year.

The ARS Administrator said that although the Congress controls the direction of research, the Office of Management and Budget (OMB) controls personnel ceilings. The Administrator confirmed the current tight personnel situation. He also said that ARS does not have the personnel slots to staff the new human nutrition research facility now under construction at Tufts University in Boston, Massachusetts, and expected to be completed by late 1982. He told us that ARS will probably operate this facility as a Government-owned, contractor-operated facility.

#### Construction of new facilities

As noted earlier, the number of ARS research facilities has increased since the late 1950's, including several that were authorized/constructed in the 1970's. Two were opened as recently as 1981, and a major new facility and additions to existing facilities were still under construction at the time

of our fieldwork. Many of these new facilities, as well as the older ones, had underused capacity--some in fact had been less than 50-percent used in terms of their designed scientific capacity. Some had never been fully used.

Most facilities authorized/constructed in recent years have come about through congressional initiatives. For example, the House added \$33.7 million to ARS' fiscal year 1979 appropriations to construct the following facilities.

<u>Facility</u>	<u>Construction cost</u>
Human Nutrition Research Center, Tufts University, Boston, Massachusetts	\$21,100,000
U.S. Dairy Forage Research Center, University of Wisconsin, Madison, Wisconsin	9,000,000
Mechanics of Erosion Research Center, Purdue University, Lafayette, Indiana	3,600,000

The House also added \$1.5 million for planning the following facilities.

<u>Facility</u>	<u>Estimated construction cost</u>
Arthropod-Borne Animal Disease Research Center, Colorado State University, Fort Collins, Colorado	\$15,800,000
Moisture Conservation and Plant Stress Laboratory, Texas Tech University, Lubbock, Texas	19,000,000

In commenting on this report, the Acting Assistant Secretary for Science and Education said:

"The estimate given for the construction of the Arthropod-Borne Animal Disease Research Center at Fort Collins is a preplan estimate. Estimated cost of construction furnished by the architect is nearly three times the preplan estimate. This increase was partially due to the highly sophisticated research to be conducted and the stringent biological security measures that must be in effect."

The then Secretary of Agriculture testified against appropriating funds for these facilities. He stated that there were opportunities within the current facilities inventory to undertake

the additional research, if needed, in most of the research areas for which these new facilities would be used. In addition, the Secretary specifically stated that the tight personnel ceiling would make it difficult to staff the Mechanics of Erosion Research Center and the Moisture Conservation and Plant Stress Laboratory, as well as the Human Nutrition Research Center.

The Assistant Secretary for Conservation, Research, and Education testified about the 548 additional scientists and support personnel, estimated to cost in excess of \$24 million, needed annually to operate the above five facilities and one that did not get funded (Children's Nutrition Research Center at Baylor College of Medicine, Houston, Texas). The Assistant Secretary said that existing facilities were about 85-percent occupied and that employment would have to be increased by more than 500 <sup>1/</sup> staff to fill existing facilities. He also testified that if the six facilities were constructed, the overall use rate of ARS laboratories would decrease to 80 percent, assuming no increase in staffing.

Due to cost escalation and inflation, additional funds had to be appropriated or otherwise allocated after fiscal year 1979 to complete the Human Nutrition Research Center. As of December 31, 1981, about \$31.2 million had been made available for planning and constructing this facility, which was scheduled to be substantially completed and ready for occupancy by September 1982. The size of the erosion facility at Purdue was later cut back to half its originally designed scientific capacity--from 15 to 8--and was completed about September 1981 at a cost of about \$4.7 million, including planning funds of \$400,000. The Dairy Forage Research Center at Madison, Wisconsin, cost about \$10.1 million, including about \$1.1 million for planning, and was completed about June 1981.

During hearings on ARS' fiscal year 1982 appropriations, the House Committee on Appropriations gave considerable attention to the funding needs of various research facilities, including the Children's Nutrition Research Center and the Moisture Conservation and Plant Stress Laboratory even though those facilities were not included in ARS' budget request. However, the committee report states that it was necessary to defer funding due to severe budget limitations. The committee said it intended to review the funding needs of those facilities in connection with the fiscal year 1983 budget. The President's fiscal year 1983 budget contained no funds for new ARS construction projects.

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<sup>1/</sup>Presumably, the Assistant Secretary, in discussing the need for 500 staff to fill existing facilities, was referring only to the number of scientist years because data presented during the same hearings showed a capacity for 3,425 scientist years compared with 2,923 on board--a difference of 502.

Although USDA did not advocate more recent research facilities--at least at the time the funds for their construction were appropriated--it had advocated many of the facilities constructed since the late 1950's and many of which were underused. As of March 1982 ARS had at least 33 research facilities that were involved in air, water, or soil conservation research, including 19 that had been built since 1958. Some of those constructed since 1958 were based on recommendations contained in Senate Document No. 59, a 1959 report of findings of a USDA study entitled "Facility Needs--Soil and Water Conservation Research," prepared at the request of the Senate Committee on Appropriations.

In commenting on our report, the Acting Assistant Secretary for Science and Education said:

"[Senate Document No. 59] contains an assessment of research needs to solve soil, water and air problems existing at that time. Many organizations and individuals contributed to this report. The land-grant colleges and universities from each state had the opportunity to respond. The Bureau of Sport Fisheries and Wildlife, Bureau of Indian Affairs, Bureau of Land Management and Bureau of Reclamation of the U.S. Department of the Interior provided material. Within USDA, the Soil Conservation Service, Forest Service, Agricultural Conservation Program Service, and Agricultural Research Service participated. Public hearings were conducted at 14 locations throughout the United States where over 700 individuals presented oral or written comments. Construction requests from the Department were to implement the recommendations of this report in an orderly manner."

The Assistant Secretary also said that usually the Department advocated construction of a particular facility to meet major research needs with the expectations that support funds would be provided for the scientific personnel when the facility was completed.

The 1959 USDA study, among other things, included recommendations for capital construction projects totaling about \$20 million (1959 dollars) to existing, as well as new, stations. At the time the study was released to the Senate, questions were raised as to the country's ability to afford the recommended projects. Some of the facilities that were recommended and later constructed had underused capacity as noted on the following page.

<u>Location</u>	<u>Date constructed</u>	<u>Scientific capacity</u>	<u>Occupancy (as of Oct. 31, 1981)</u>	
			<u>ARS only</u>	<u>Total</u>
Kimberly, Idaho	1961	27	18	27
Sidney, Montana	1965	11	7	9
Durant, Oklahoma	1969	12	9	11
Pendleton, Oregon	1970	13	8	13
Orono, Maine	1973	7	3	4
Akron, Colorado	1976	9	4	4

Some of ARS' other newer and expensive research facilities are among the most poorly used. For example, on June 16, 1964, the Congress authorized a meat animal research center at Clay Center, Nebraska, a major U.S. meat-producing area. This research center, on the site of a former military ordnance facility, contains almost 35,000 acres. ARS started developing the center in phases in the spring of 1966. Phase I, completed in January 1971, provided a physical plant for 42 scientists and about 200 support personnel. Phase II construction consisted of the meat research building and an agricultural engineering building completed in October 1977. Phase II provided a physical plant for 25 additional scientists and about 60 more support personnel. Thus, completed phases provided physical facilities for a total of 67 scientists and about 260 support personnel. Phase III, not yet funded, would provide facilities for an additional 35 scientists and 65 support personnel working in forage research.

As of November 1981 ARS had invested about \$15.9 million in buildings, facilities, and real property improvements at the meat research center. This amount did not include the value of the land (acquisition cost of about \$1.9 million) or the value of buildings, structures, and improvements (carried in the inventory at about \$12.7 million) that were on the property when ARS took possession. However, some of the property may be of little value for research purposes. About \$4 million was also invested in equipment and other personal property items for this research facility. For fiscal year 1981 the center's operating budget was slightly more than \$5 million.

Despite ARS' sizable investment, the center has not been well used in terms of its designed scientific capacity, as the table on the following page shows.

<u>Date</u>	<u>Scientific capacity</u>	<u>Number of scientists assigned</u>	<u>Percent staffed</u>
June 30, 1976	44	25	57
Sept. 30, 1977	44	29	66
Sept. 30, 1978	a/67	27	40
Dec. 31, 1979	67	30	45
Oct. 31, 1980	67	44	66
Oct. 31, 1981	67	35	52

a/Increased capacity due to completion of phase II construction in October 1977.

The Assistant Secretary for Conservation, Research, and Education in a statement prepared for the Senate hearings on USDA's fiscal year 1979 appropriations said the following about the use of the meat animal research center--which was offered as a dramatic example of an understaffed facility.

"\* \* \* our Clay Center, Nebraska, facility which is currently staffed at about 40 percent of capacity. This less than optimum utilization has been a major concern to both the Department and the Congress. In fact, a report was issued by the House Appropriations Committee in February 1978 decrying this problem. The construction of new facilities with a level or declining staffing pattern will simply require that our present workforce be spread even more thinly."

On page 13 we cited a USDA official's testimony to the effect that staffing for new research facilities would be at the expense of existing facilities because of the personnel ceiling. This testimony referred to facilities authorized by the fiscal year 1979 appropriation act. At the time of our fieldwork, two of those facilities had just been completed, one was soon to be completed, and two were still being planned. The two facilities completed in 1981 were no more than 50-percent staffed in terms of their scientific capacity as of October 31, 1981. A decision had not been made as to how the soon-to-be-completed nutrition research facility at Tufts University would be staffed. As stated on page 11, the ARS Administrator said that ARS had no personnel slots to staff this facility and it would likely be operated as a Government-owned, contractor-operated facility.

We noted that staffing new facilities sometimes occurred at the expense of existing facilities. For example, the Richard B. Russell Agricultural Research Center at Athens, Georgia, completed in 1969, was intended to do research in postharvest technology. Previously, four regional research centers were also established to do postharvest technology research. Subsequently, each of the regional research centers lost programs to the Russell research center, and as of October 31, 1981, they were less than fully used, as indicated by the table on the following page.

<u>Location</u>	<u>Capacity</u> (as of Oct. 1981)	<u>Occupancy</u>
Berkeley, California	175	134
Peoria, Illinois	180	161
New Orleans, Louisiana	185	138
Philadelphia, Pennsylvania	170	153

#### ARS' APPROACH TO IMPROVE USE

ARS has tried various ways to improve the use of its research facilities. Over the years some facilities have been closed. In an increasing number of cases, ARS has entered into cooperative agreements with State agricultural experiment stations under which employees are hired by the experiment stations to work in federally controlled facilities as support personnel, such as technicians and maintenance staff. At some locations certain functions, such as maintenance services, have been contracted out in the interest of maintaining positions for scientists. In addition, some ARS-owned research facilities are better used only because space is leased out or otherwise used by non-ARS scientists. These methods have undoubtedly helped improve the use of existing facilities but other actions are needed.

#### Closures

ARS has closed research facilities, but few such closures have occurred in recent years. The ARS Administrator and two regional administrators said that the anticipated adverse reaction from industry and the local community against closing a research facility discouraged them from trying to close facilities they considered no longer essential. Most facilities closed during recent years were small, and some were not Government-owned.

In commenting on this report, the Acting Assistant Secretary for Science and Education said that as a result of local and industry interests working through Members of Congress, some facilities and research had been continued which otherwise would have been discontinued with the resources redirected to higher priority research.

ARS closed part or all of at least two of its research operations because replacement facilities had been constructed. At Newell, South Dakota, ARS' facility was eventually closed after a new facility at Sidney, Montana, opened in 1965. In 1980 ARS' research being conducted in State-owned space at West Virginia University at Morgantown was transferred to the new soil and water conservation research facility at Beckley, West Virginia. We noted that in another case ARS had terminated a research effort and assigned the scientist to a higher priority effort but later reversed this decision because of congressional direction.

ARS officials were reluctant in many cases to discuss the specifics of the opposition to closing facilities. However, some officials indicated that many individuals, including industry, State, and local officials and members of the Congress, disagreed with ARS' proposed closings. We had difficulty verifying this information because the files on attempted closures were not always available, often due to passage of time. However, in five cases we were able to review files on proposed closings and noted specific correspondence from various sources opposing such closings.

In March 1982 testimony before the Subcommittee on Agriculture, Rural Development, and Related Agencies, House Committee on Appropriations, the ARS Administrator said that no laboratory space had been released during the past year. The Director of USDA's Science and Education Administration gave similar testimony before the same subcommittee the year before. Several proposed closures were pending at the conclusion of our fieldwork. Also, the ARS Administrator said that ARS had formulated plans, not yet approved by USDA, to close between 10 and 12 research locations and to redirect some research effort at other locations and use the funds for higher priority research. Any facility closures should help improve the overall use rate of ARS' remaining facilities if any research effort is directed into those facilities. However, the use rates of some facilities may decrease in the future if a portion of their effort is discontinued but the facilities remain open.

#### Cooperative agreements with State and other educational institutions

At some laboratories we visited, employees of State agricultural experiment stations or other educational institutions were working under cooperative agreements between ARS and the stations or institutions. In some cases ARS reimbursed the stations or institutions for the employees' salaries and related costs of providing services under the cooperative agreements. But in other cases the costs were paid from a State-operated revolving fund derived from the sale of such things as crops and animals used in the research.

Most non-Federal employees hired under cooperative agreements were support personnel, such as laboratory technicians and farm workers. However, at the human nutrition research centers, including the one we visited, the cooperative agreements also included scientists, doctors, and other professionals.

We did not determine how many non-Federal employees were working in ARS' research facilities under such cooperative agreements but based on our visits, we believe the number could be significant. At several facilities we visited, many employees were employees of the agricultural experiment station or an educational institution. For example, at the soil and moisture conservation research facility at Beckley, West Virginia, 17

of 36 employees were employees of West Virginia University. At the meat animal research center in Nebraska, only 56 of the 310 employees were Federal employees. The rest were employed by the University of Nebraska--the State agricultural experiment station.

Generally, we were told that the arrangements to use non-Federal employees were made partially to avoid the personnel ceiling. Cooperative agreements should not be used solely for the purpose of avoiding personnel ceilings or Federal salary limitations. However, the main purpose of the cooperative agreements was to conduct research mutually beneficial to both the State and Federal Governments. Other results from the use of the cooperative agreements were an increase in the facilities' use and the saving of personnel slots for scientists.

At the nutrition research centers an additional factor in using cooperative agreements was avoidance of Federal salary limitations, especially for medical doctors. The directors of the research facilities we visited seemed satisfied with these arrangements although at least one would have preferred Federal employees, because it allowed better control over the employees.

#### Contracting out

As stated in House hearings on the 1981 appropriations, early in 1979 the Director of USDA's Science and Education Administration, recognizing the personnel ceiling imposed as a result of the Civil Service Reform Act of 1978, decided that the Federal Government's interest in maintaining ARS as a viable research organization would necessitate either reducing administrative staff or contracting out for support services. In ARS' view, a reduction in staff or contracting out was required so as to retain an adequate number of core positions, which consist of scientists and technicians. He chose to contract out certain support services at large research facilities after making a study of the various activities in ARS to determine if savings in positions could be obtained through either contracting out or other alternatives. These services included engineering, plant management, janitorial, and general services. Although we believe that contracting out to save personnel slots is not consistent with OMB regulations, we note that the matter has been disclosed to the House Subcommittee on Agriculture, Rural Development, and Related Agencies.

According to a February 1980 report by the Surveys and Investigations Staff, House Appropriations Committee, as of October 1, 1979, there were contracts for the equivalent of 109 staff years--principally for guards and janitorial services. For example, the Western Regional Research Center no longer had a janitorial and gardening staff because these services were contracted for. The center later closed out its sheetmetal, pipefitting, and glassblowing services and converted the shop areas

to a "do it yourself" operation. It also discontinued guard services and switched to an electronic card and alarm system.

At the time of our visits to three research facilities, decisions were still pending on contracting out certain services. An administrator at the Southern regional office told us that its ceiling was already reduced by 30 slots, assuming that plant management services would be contracted out, but the decision was still pending. Subsequent to our visit to the Eastern Regional Research Center, the ARS Administrator told us that a decision had been made to contract out certain services at that center.

#### Leasing to other Federal or State agencies

As of October 31, 1981, about 10 percent of the rated scientific capacity of ARS-owned or -leased research facilities was leased out or was otherwise used by non-ARS scientists. About 320 non-ARS scientists were using space at 54 research facilities; most of them were employed by other USDA agencies and various State agricultural experiment stations.

The non-ARS scientists' use of ARS-controlled research space not only improved the overall use of ARS' research facilities by about 10 percent, but for some facilities, non-ARS use meant the difference between poor use and fair to good use. As examples, two of ARS' costlier research facilities would have been poorly used if a significant portion of their research capacity was not leased to other USDA agencies.

The National Animal Disease Center in Ames, Iowa, completed in about 1962, had a rated capacity of 130 scientists. It represents an investment of over \$21 million in buildings and other real property and almost \$4 million in equipment. As of October 31, 1981, ARS had 70 scientists at this facility--or about 54 percent of capacity. But 35 scientists from USDA's Animal and Plant Health Inspection Service were also using research space at this facility on a reimbursable basis. In total, the Ames facility's capacity was about 81-percent used. However, it should be pointed out that when the Ames facility was constructed, the Animal and Plant Health Inspection Service was part of ARS and it also used more of the space. In 1972 the Animal and Plant Health Inspection Service became a separate agency.

The Richard B. Russell Agricultural Research Center at Athens, Georgia, completed in 1969, had a rated capacity for 105 scientists. It represents an investment of about \$11.5 million in buildings and other real property and about \$5 million in equipment. As of October 31, 1981, ARS had 57 scientists assigned to the center, or about 54 percent of capacity. However, 24 scientists from USDA's Food Safety and Inspection Service were using about 28 percent of the center's laboratory space under a reimbursable agreement with ARS. In addition, 15 other non-ARS scientists, mostly from the University of Georgia--the State

agricultural experiment station--were using center space. Thus, the center's capacity was about 91-percent used as of October 31, 1981.

In commenting on this report, the Acting Assistant Secretary for Science and Education said that the sharing of facilities improves communication among the scientists and enables the sharing agencies to carry out their roles and missions more effectively.

## CHAPTER 3

### PLANNING FOR THE SYSTEMATIC

#### CLOSING OF RESEARCH FACILITIES

With continued ARS hiring and funding constraints, the problem of underused Federal laboratory space for agricultural research likely will continue. Bringing in State employees under cooperative agreements or leasing space to other Federal agencies helps improve laboratory use, but these alternatives will not likely solve the problem. States are sometimes reluctant to use Federal research facilities either because they are not designed to meet State needs or because of differing geographic locations. Also, other Federal agencies are faced with funding and staff limitation problems similar to those ARS faces. In the existing environment of projected Federal budget cuts and growing deficits, closing research facilities and, where appropriate, consolidating these functions with others, may be the most viable alternative available for reducing underused capacity.

ARS does not have a comprehensive plan to reduce the number of ARS-owned research locations. Prior attempts to close individual laboratories often resulted in opposition from those most directly affected, such as individual scientists and their families, local community leaders, and representatives of the industry the research affected. As a result, any plan to close laboratories will need to be well coordinated and justified to those parties having an impact on the decision process. We believe that in developing a plan, factors such as the following need to be considered in determining which facilities to close.

- The need for facilities where scientists have access to
  - (1) enough other scientists for useful interaction and
  - (2) up-to-date equipment and facilities.
- The efficiencies and economies of conducting research.
- Research priorities.
- Personal and career plans of employees affected.
- Cost of relocating employees and potential sales value or alternative use of unneeded real estate.

Many ARS officials we interviewed said that they believed a correlation exists between laboratory size and the first two factors. For example, small Federal laboratories, unless located near universities or State agricultural experiment stations, provide less opportunity for scientists to interact with many other scientists. As of October 31, 1981, ARS had 31 research locations that had 10 or fewer scientists and were located away from State agricultural experiment stations or branches or other educational institutions. In addition, smaller locations generally have less

opportunity to acquire and use scientific equipment and often make less efficient use of equipment and administrative resources.

However, small research locations do allow for site-specific research. There are scientific reasons for conducting research in certain locales and not others, including (1) capacity to grow more than one crop in a growing season, (2) proximity to research problems, or (3) ability to contain disease organisms. These reasons may be a factor which in some cases overrides the interaction and efficiency issues. In these cases ARS could consider using cooperative agreements with State agricultural experiment stations, in conjunction with land-grant colleges and universities, to accomplish appropriate site-specific research. ARS has used such agreements successfully in the past.

#### SCIENTIST INTERACTION

According to USDA and ARS officials and ARS scientists, scientists need to interact with each other to effectively carry out research activities. An exchange of ideas is important to researchers.

In Senate hearings on USDA's fiscal year 1979 appropriations, the Assistant Secretary for Conservation, Research, and Education expressed his concern about personnel being spread among too many facilities and his belief that laboratories with fewer than 10 scientists were really not a viable "critical mass" because scientists need to interact with other scientists. ARS headquarters and regional and area office administrators, program officials, and laboratory directors had varying opinions about critical mass, but they believed that enough scientists and other resources should be available to solve research problems in a reasonable period of time.

The House Appropriations Committee's Surveys and Investigations Staff reported in 1980 that many ARS research facilities had fewer than 10 scientists. The report stated that 83 such facilities existed in 1977, and it projected that 85 would exist in 1981. It advocated the need for research facilities to have a group of scientists of varied disciplines--a critical mass--which if properly assembled and correctly managed would have great potential for and ability to deal with complex research problems. The report recognized that some research locations with fewer than 10 scientists were within or near State or other Federal research facilities and therefore had a critical mass when their resources were combined with those of other scientists. However, the report stated that ARS must act when it finds a research facility that does not have a critical mass and suggested that there may be a need to retrench to preserve existing critical masses of talent or to establish new ones. The ARS Administrator told us that ARS officials met with the Surveys and Investigations Staff, determined which locations the staff was concerned about, and then took appropriate action. He told us about two of the actions. The Brawley, California, location was downgraded to a worksite

and the scientists were detailed elsewhere, and the Indio, California, location will be closed.

We discussed the benefits of scientist interaction with ARS headquarters and regional and area office administrators, program officials, laboratory directors, and scientists. They made similar comments.

- One regional research center director said that large laboratories allow for scientist interaction. He said that such interaction was extremely beneficial because scientists are interested in what their peers are doing and tend to help each other solve problems.
- A laboratory director said that intellectual stimulation was important and without it researchers lose their objectivity and imagination. He and other scientists at the laboratory interacted among themselves and with scientists at a nearby State land-grant university.
- Another laboratory director said that scientists at his laboratory interact constantly and that strong peer pressure exists.

ARS recognized the need for scientist interaction in a 1982 report on its program review of research activities at the Dairy Experiment Station at Lewisburg, Tennessee, which employed three scientists as of October 31, 1981. Although research at the station was conducted cooperatively with the University of Tennessee at Knoxville, ARS said that the station was too remote and, as a result, communication among scientists was inhibited. Lewisburg is about 180 miles from Knoxville.

The Corn Insects Research Laboratory's five scientists at Ankeny, Iowa, faced similar problems, according to its research leader, and it is only 25 miles from the Iowa State agricultural experiment station.

According to many ARS officials, small research locations away from university campuses have more difficulty recruiting scientists than those laboratories on campuses because of the lesser opportunity for scientist interaction. Several ARS scientists said that they would be reluctant to move to a small, remote research unit for this reason.

ARS had consolidated research activities of several of its locations and was considering other consolidations to improve scientist interaction. One of the consolidations concerned cotton research. In 1980 ARS closed a cotton quality laboratory at Knoxville, Tennessee, and transferred the research activity to the Southern Regional Research Center in New Orleans, Louisiana. According to a regional program analyst, the cotton program was helped as a result of the consolidation because it allowed day-to-day interaction between the two groups' scientists. Also,

a Southern Regional Research Center administrator said that the Knoxville research was closely related to the research at the New Orleans center. For a long time, he said, ARS officials believed that the cotton program was segmented. From his own experience, he said there had previously been no mesh between cotton harvesting and cotton ginning research. He said that potential also existed for other cotton research to be consolidated at the Southern Regional Research Center.

Another planned consolidation concerned the Stored Product Insects and the Market Quality and Transportation Research Laboratories both located in Fresno, California. As of February 1982 ARS was recruiting one research leader for the two groups, attempting to foster idea exchanges and cross-utilize resources. A physical consolidation was planned for a later time.

#### USE OF EQUIPMENT, FACILITIES, AND ADMINISTRATIVE RESOURCES

ARS officials told us that they believed that research locations with the larger numbers of scientists made more use of scientific equipment and facilities and were able to use administrative resources more effectively. Also, they believed that if ARS had fewer research locations, the number of administrative offices and associated personnel could be reduced.

Many ARS officials we interviewed, including some at smaller research locations, said that small laboratories often could not justify new scientific equipment because of the few scientists in the laboratories to use the equipment. Administrators of all four regional research centers said that available, up-to-date scientific equipment was an advantage their scientists had over scientists at smaller locations, unless the smaller laboratory was at or very near a university. Small research laboratories at or near universities or State agricultural experiment stations may have access to equipment and therefore have no need to purchase it. Many regional and area office administrators, laboratory directors, and scientists said that researchers' equipment needs can be met through cooperative agreements with nearby State agricultural experiment stations.

Research locations with larger numbers of scientists were also able to employ technicians to operate the specialized equipment based on a higher rate of equipment use. ARS officials said that hiring technicians was beneficial to research. For example, one regional research center administrator said that the center derived the maximum benefit from its equipment by hiring a specialist to operate it. A second regional research center administrator said that when a small location has expensive equipment, but no technicians to operate it, the scientists must spend their valuable time trying to keep their equipment-operating skills current. One scientist said that he had to learn how to operate equipment he would not otherwise need to learn if he were stationed at a larger location. He said that a scientist

stationed at a smaller location has to become self-reliant. The time scientists spend developing equipment skills reduces the time available for research.

We noted that at larger facilities, many research units may use the same piece of equipment. For example, at the Richard B. Russell Agricultural Research Center we observed a technician operating a mass spectrometer in the Tobacco and Health Laboratory. According to the technician, 25 percent of the time she spends operating the mass spectrometer is for the other laboratories within the center.

We observed and were told of other ways that larger locations can use their equipment. For example, at the U.S. Meat Animal Research Center in Nebraska, the equipment was placed so that it could be used by many scientist groups. Experienced equipment operators were able to help the scientists. In addition, ARS officials told us of situations where large facilities receive and analyze samples for smaller facilities that do not have sophisticated equipment.

Besides using scientific equipment more efficiently, larger groups of scientists are also able to use other equipment, such as word processing and data processing equipment, more efficiently. For example, at one regional research center newly installed automatic data processing equipment was located in a central area and was available for all research activities. There and at other locations, we observed other nonscientific equipment, such as word processing and duplicating equipment, organized in a pool concept.

Various ARS officials told us that research locations with larger numbers of scientists had other administrative advantages over smaller locations, including:

- More effective use of typists and secretaries. A research location serving only a few scientists could justify the need for a secretary or typist but not have enough work to use one efficiently. In comparison, laboratories serving large numbers of scientists have typing pools which can be more easily adjusted to need.
- More efficient use of administrative and personnel officers. For example, a Western Regional Research Center administrator said that facilities serving large numbers of scientists make better use of personnel specialists. The center employed two personnel specialists to serve its approximately 300-member staff, whereas a smaller laboratory may have employed one to serve the much smaller staff.

Research locations serving large numbers of scientists can also use specialized buildings, such as greenhouses, more efficiently. According to ARS officials, researchers at a small location may need a greenhouse and be able to justify its

construction, but not be able to completely fill it. If that research was done at a location serving many researchers, the greenhouse could be shared and therefore be better used.

Fewer research locations may allow ARS to reduce its administrative staff. ARS established area offices in 1972. These offices and their administrators were, among other purposes, to improve research efficiency and effectiveness by

- protecting research scientists from time-consuming administrative details and paperwork;
- maximizing the return on research dollars through the best match of money, personnel, and equipment; and
- promoting multidisciplinary research by encouraging research scientists to work with scientists of other disciplines to improve the quality of research results.

In fiscal year 1982 ARS had 14 area offices, excluding the major research facilities considered as area office equivalents. Combined, the 14 area offices employed about 80 persons and had a budget of almost \$2.9 million. (See app. III for a list of office locations, staff levels, and budgets.) Area office officials generally report to regional officials.

Several recent studies question how many management levels ARS needs--OTA's study (see p. 2) and separate studies being made at the time of our fieldwork by White House staff and by ARS' organization and management development staff. The last study was initiated by the ARS Administrator.

OTA's report suggested two policy options for ARS management. Both options would eliminate the need for area offices although regional offices would remain. The report stated that area directors appeared to have no technical or scientific function and that additional study and evaluation were needed of how to use them more effectively.

We discussed with ARS headquarters, regional, and area office administrators; program officials; and laboratory directors the potential for reducing the number of area offices if there were fewer research locations. They generally agreed that potential exists to reduce the number of area offices. For example:

- The Administrator said that one reason area offices were established was to force multidisciplinary research approaches. This, he said, had largely been accomplished. He emphasized that he was receptive to all organizational possibilities and would not formulate an opinion until all the studies were completed.
- A headquarters program official said that as long as ARS has so many small laboratories, it needs the area offices

for management. When the number of laboratories decreases, ARS should close some area offices.

--One laboratory director said that he believed area offices were a nonessential expense and that they used up personnel slots and took scientists out of research.

--An area director said that area offices have a vital function to perform as long as ARS has many research locations.

The ARS Administrator said that if ARS could decrease its administrative staff, the freed personnel slots could be filled by research personnel. He said that all the area directors and regional administrators are former scientists and most of them would be highly qualified to return to research as research unit leaders.

#### PERSONNEL CONSIDERATIONS

Closing Federal research locations would require ARS to move or lay off Federal employees and to pay associated costs. According to ARS Western Regional Office officials, moving one employee costs between \$12,000 and \$15,000. These costs would have to be offset by the potential sales value or alternative use of unneeded laboratories and any reduction in operating and maintenance costs. The costs would not include the cost to the employee of possibly moving to a higher cost-of-living area or having to pay a higher mortgage interest rate for a home. Nor can a price be placed on the cost to morale of uprooting a scientist and family and redirecting the scientist's career.

Such a career change, according to ARS officials, may have long-range professional and financial repercussions to a scientist. Because much ARS research is long term, a scientist may work for several years to achieve publishable results. Publications are one element that supervisors consider when deciding to promote a scientist. Therefore, a scientist who starts new research as a result of a move and experiences the expected delay before publishing the

As stated on page 18, ARS had formulated plans to close between 10 and 12 research locations and redirect the relevant research funds to higher priority research. It also planned to redirect research funds from some facilities that will remain. The impetus for this action was a White House directive that all departments, except the Department of Defense, identify the 20 percent of their activities that had the lowest priority and could be cut. Although the President's fiscal year 1983 budget requested additional funding for ARS, ARS planned to redirect 20 percent of its funds to higher priority research and eliminate research that had the lowest priority.

These plans, however, were designed to cut back on ARS' lowest priority research but were not based on a comprehensive review of underused research facilities. As mentioned above, some of the funding will be redirected from facilities that will remain open. Unless these facilities receive new programs, their respective use will likely decrease.

## CHAPTER 4

### OBSERVATIONS, CONCLUSIONS, RECOMMENDATIONS, AND AGENCY COMMENTS

Many of ARS' research facilities are not staffed to their design capacity. This underuse resulted primarily from a declining personnel ceiling and construction of new facilities. To fully use its existing facilities, ARS would require a substantial increase in funds and people--something that is not likely to happen in the current environment of projected Federal budget cuts and growing deficits. Agricultural research is one of the few areas to receive a budget increase but, according to ARS, the increases do not fully cover the loss in purchasing power due to inflation. ARS research activities could be carried out more effectively and efficiently if they were conducted at fewer locations with a larger concentration of scientists. The Congress and USDA should work together to accomplish this goal.

#### PLANNING FOR BETTER USE OF EXISTING RESEARCH FACILITIES

During the past 25 years the number of ARS-owned or -leased research facilities has increased. Also, more facilities are planned even though ARS use of the research facilities was only about 73 percent--with many being used to a much lesser degree. ARS has leased an additional 10 percent to non-ARS scientists and has tried to close facilities that it considered no longer necessary but had been successful in only a few cases during the past several years. ARS officials told us that adverse reactions from industry and the communities affected by the proposed closures often discouraged such steps. (See ch. 2.)

Additional actions are necessary to get more efficient use from ARS research laboratories and to provide for greater scientific interactions. Without significant change in the current environment of Federal budget cutting and growing deficits, closing laboratories may be the most viable option available for reducing the underused capacity because State governments and other Federal agencies are likely to be faced with the same constraints that ARS faces or have different objectives. As a result, they may not be able to use the facilities either.

Closing a research facility is generally opposed by those most closely affected. This opposition is not unexpected because local employment opportunities, employees, and the local economy in general are adversely affected. However, in view of the potential benefits available, ARS needs to develop a plan for reducing the number of agricultural research laboratories. In developing this plan, ARS needs to give attention to the need for scientists to interact with other scientists and to have access to modern scientific equipment; the efficient and economical use of equipment, facilities, and administrative resources; research

priorities; personal and career plans of its employees; the costs of relocating employees; and the potential sales value or alternative use of unneeded laboratories.

In view of the likely impact on individuals and local communities, long-term planning and good justifications for closing laboratories are necessary before research laboratories can be closed. ARS needs to develop comprehensive plans to reduce the number of research locations. (See ch. 3.)

#### Recommendations to the Secretary of Agriculture

We recommend that the Secretary develop a plan to consolidate agricultural research activities at fewer locations, thereby allowing greater scientist interaction and more efficient use of equipment, facilities, and administrative resources. The plan also needs to address research priorities, personal and career plans of ARS employees, the costs of relocating employees, and the potential sales values of unneeded laboratories. We also recommend that the Secretary submit the plan to the appropriate committees of the Congress for their review and comments.

#### Agency comments and our evaluation

USDA's Acting Assistant Secretary for Science and Education said (see app. IV) that ARS was developing a strategic plan to use as a basis for future research management. He added that the implementation and operational plans that support the strategic plan should be an excellent basis for the Secretary to assure consolidation of research and permit greater scientist interaction for more efficient use of equipment, facilities, and administrative resources. He said, however, that in view of ARS' experiences with various congressional sources objecting to actions taken to close laboratories in the past, our proposal that plans for closing laboratories be submitted to the Congress for review and approval was not realistic. He said that executive branch responsibility should be allowed to proceed normally in decisions to close facilities in the course of program administration, which includes congressional involvement during the appropriation process for major closures.

We understand the concerns expressed regarding congressional approval of the plan. We have modified the recommendation to more clearly state our intent. We believe that because of the past difficulties experienced in individual closings, congressional support needs to be obtained for a comprehensive plan for improving the overall use of research facilities. Therefore, as a minimum, the plan needs to be provided to the Congress to use as a basis for ensuring congressional understanding of the plan's strategy and the ramifications of altering portions of the plan to satisfy concerns from locally impacted individuals and/or organizations.

## FUTURE RESEARCH FACILITIES

The use of ARS' research facilities will not improve if new facilities continue to be constructed at the same time the personnel ceiling is declining and laboratory closures are thwarted. Under these conditions, the use situation can only deteriorate.

New facility construction or major expansion of existing space should be tied in to long-range research goals and objectives. ARS' development of implementation and operational plans to support a strategic plan that it is currently developing as a basis for future research management should provide a clearer understanding of ARS' goals and objectives to the agricultural community as well as the executive branch and the Congress. This effort began in December 1981 in response to our July 1981 long-range planning report 1/ and the December 1981 OPA study. (See p. 2.) Our report included legislative language to amend title XIV of the Food and Agriculture Act of 1977 to improve planning for agricultural research by requiring the Secretary of Agriculture to develop, in conjunction with the agricultural community, a long-term needs assessment for food and fiber and to determine the research necessary to meet those needs. Similar language was included in the Agriculture and Food Act of 1981 (Public Law 97-98), which was enacted in December 1981.

These plans, when completed, should provide useful information to the Congress for making funding decisions on new facilities.

### Matters for consideration by the Congress

Given the currently underused research facilities, the unlikely prospects for personnel ceiling increases for ARS, and the congressional mandate to conduct a long-range needs assessment and determine the research necessary to meet those needs, the Congress should consider not authorizing or providing funds for additional research facilities until ARS has completed its planning process and the Congress has had an opportunity to study those plans. In the future, as the Congress deliberates the need for any additional research facilities, the plans, if periodically updated, should be helpful in determining whether available ARS facilities are adequate, or could be modified or expanded at a reasonable cost, to carry out the needed research. Further, when the Congress entertains proposals for new facilities, it should consider requiring ARS to promptly provide it with (1) an inventory of possible unused or underused non-ARS facilities that could be modified to meet the research needs and information on the cost of such modifications, (2) information on the feasibility of having non-ARS scientists do the needed research, such as by cooperative

1/"Long-Range Planning Can Improve the Efficiency of Agricultural Research and Development" (CED-81-141, July 24, 1981).

agreements with State agricultural experiment stations, and (3) information on how the research will be staffed if personnel ceilings prevent the hiring of new personnel to staff the facility, so that it can consider that information fully during its deliberations.

#### Agency comments and our evaluation

USDA's Acting Assistant Secretary for Science and Education said that the report correctly states that many ARS laboratories are not staffed to their designed capacity but that it does not adequately emphasize (1) the effects of political and economic considerations that shape agricultural research programs, which in turn directly influence the ability to effectively use the facilities or (2) the adverse effect on program needs if planning is centered on the use of space. For example, the Acting Assistant Secretary said that in the past many new facilities were fully staffed but with inflation the number of employees had to be reduced to the detriment of the research. He added that more recently OMB has not granted the necessary personnel slots nor has the Congress always appropriated the funds necessary for operating facilities.

We understand the political and economic factors involved and believe that they are discussed in the report. We believe that the matters for congressional consideration presented above reflect these factors and are necessary to increase the prospects for better future use of ARS research facilities.

We agree that planning that centers solely on the use of space would not be appropriate. It is for this reason that we are recommending the development of a plan that considers the political and economic factors we discuss in chapter 3.

AFS RESEARCH FACILITIES WE VISITED

<u>Research facility</u>	<u>Location</u>	Capacity as of October 1981	Occupancy as of October 1981			Percent used	
			<u>ARS</u>	<u>Non-ARS</u>	<u>Total</u>	<u>ARS</u>	<u>Total</u>
		----- (scientist years) -----					
National Animal Disease Center	Ames, Iowa	130	70	35	105	54	81
Roman L. Hruska, U.S. Meat Animal Research Center	Clay Center, Nebr.	67	35	0	35	52	52
Cereal Rust Laboratory	St. Paul, Minn.	7	4	0	4	57	57
Plant Science Research	St. Paul, Minn.	3	1	1	2	33	67
North Central Soil Conservation Research Laboratory	Morris, Minn.	15	9	1	10	60	67
U.S. Dairy Forage Research Center	Madison, Wis.	14	4	0	4	29	29
Human Nutrition Center	Grand Forks, N. Dak.	12	12	0	12	100	100
Metabolism and Radiation Research Laboratory	Fargo, N. Dak.	43	48	8	56	112	130
Northern Regional Research Center	Peoria, Ill.	180	160	1	161	89	89
Corn Insects Research Laboratory	Ankeny, Iowa	5	5	0	5	100	100
Western Regional Research Center	Berkeley, Calif.	175	129	5	134	74	77
Stored Product Insects Research Laboratory	Fresno, Calif.	8	6	0	6	75	75
U.S. Horticultural Field Station	Fresno, Calif.	8	8	0	8	100	100
Biological Control of Weeds Laboratory	Albany, Calif.	5	5	0	5	100	100

35

<u>Research facility</u>	<u>Location</u>	Capacity as of October 1981	Occupancy as of October 1981			Percent used	
			<u>ARS</u>	<u>Non-ARS</u>	<u>Total</u>	<u>ARS</u>	<u>Total</u>
----- (scientist years) -----							
U.S. Agricultural Research Station	Salinas, Calif.	15	10	2	12	67	80
Livestock and Range Research Station	Miles City, Mont.	10	9	0	9	90	90
Animal Diseases Research (note a)	Pullman, Wash.	3	3	0	3	100	100
Hemoparasitic Disease Laboratory	Pullman, Wash.	7	3	0	0	43	43
Southern Regional Research Center	New Orleans, La.	185	124	14	138	67	75
Richard B. Russell Agricultural Research Center	Athens, Ga.	105	57	39	96	54	91
Southeast Poultry Research Laboratory	Athens, Ga.	13	11	1	12	85	92
Southeastern Fruit and Tree Nut Research Laboratory	Byron, Ga.	24	13	0	13	54	54
Southern Piedmont Conservation Research Center	Watkinsville, Ga.	18	9	1	10	50	56
Eastern Regional Research Center	Philadelphia, Pa.	170	151	2	153	88	90
Appalachian Soil and Water Conservation Research Laboratory	Beckley, W. Va.	20	8	0	8	40	40
Beltsville Agricultural Research Center	Beltsville, Md.	546	400	85	485	73	89

a/Space provided by the Agricultural Experiment Station, Washington State University.

ARS NATIONAL, REGIONAL, AND AREAOFFICES WE VISITED

<u>Office</u>	<u>Location</u>
National headquarters	Washington, D.C.
Regional offices:	
Northeastern	Beltsville, Md.
North Central	Peoria, Ill.
Western	Oakland, Calif.
Southern	New Orleans, La.
	<u>Territory covered</u>
Area offices:	
St. Paul, Minn.	Michigan, Minnesota, Wisconsin
Fargo, N. Dak.	Alaska, North Dakota, South Dakota
Fresno, Calif.	California, Hawaii
Pullman, Wash.	Idaho, Oregon, Washington
Athens, Ga.	Alabama, Georgia

ARS AREA OFFICES AS OF FISCAL YEAR 1982

<u>Area office</u>	<u>Territory covered</u>	<u>Staff years</u>	<u>Budget</u>
Fresno, Calif.	California and Hawaii	8.0	\$ 285,900
Logan, Utah	Arizona, New Mexico, Nevada, and Utah	6.0	168,700
Fort Collins, Colo. (note a)	Colorado, Wyoming, and Montana	6.0	190,300
Pullman, Wash.	Oregon, Washington, and Idaho	6.0	178,900
College Station, Tex.	Oklahoma and Texas	6.8	220,700
Stoneville, Miss.	Mississippi, Louisiana, and Arkansas	6.0	220,800
Gainesville, Fla.	Florida, Puerto Rico, and the Virgin Islands	5.0	244,900
Athens, Ga.	Georgia and Alabama	8.0	276,000
Raleigh, N.C.	North and South Carolina, Tennessee, Kentucky, and Virginia	6.0	216,400
Ithaca, N.Y.	Maine, New Hampshire, Ver- mont, New York, New Jersey, Pennsylvania, Connecticut, Delaware, West Virginia, Maryland, Rhode Island, and Massachusetts	4.4	207,400
West Lafayette, Ind. (note a)	Illinois, Indiana, and Ohio	4.0	166,615
Columbia, Mo.	Iowa, Missouri, Kansas, and Nebraska	5.1	196,100
St. Paul, Minn. (note a)	Michigan, Minnesota, and Wisconsin	3.8	141,700
Fargo, N. Dak. (note a)	North and South Dakota, and Alaska	<u>3.6</u>	<u>153,671</u>
Total		<u>79.7</u>	<u>\$2,868,086</u>

a/The Fargo Area Office was abolished as of June 1, 1982. The St. Paul Area Office was assigned responsibility for research activities in North Dakota and South Dakota, the Fort Collins Area Office was assigned responsibility for research activities in Alaska, and responsibility for research activities in Michigan was transferred from the St. Paul Area Office to the West Lafayette Area Office.



DEPARTMENT OF AGRICULTURE  
OFFICE OF THE SECRETARY  
WASHINGTON, D. C. 20250

SEP 23 1982

Mr. Henry Eschwege  
Director, Community and  
Economic Development Division  
General Accounting Office  
441 G Street, N.W.  
Washington, D.C. 20548

Dear Mr. Eschwege:

Attached are Science and Education's comments on your draft report entitled, "Underutilized Federal Agricultural Research Facilities - A Condition Needing Congressional and Department of Agriculture Attention."

We appreciate the opportunity to review and comment on the draft report.

Sincerely,

A handwritten signature in cursive script that reads "T. B. Kinney, Jr." with a long, sweeping flourish at the end.

T. B. KINNEY, Jr.  
Acting Assistant Secretary  
Science and Education

Enclosure

## Comments on GAO Draft Report Entitled

"Underutilized Federal Agricultural Research Facilities - A Condition  
Needing Congressional and Department of Agriculture Attention"

The report is correct in its statement that many ARS laboratories are not staffed to their designed capacity. However, it does not adequately emphasize the effects of political and economic considerations that shape the agricultural research programs--primarily through the budget process--which in turn directly influences the ability to effectively utilize the facilities nor does it emphasize the adverse effect on program needs if planning becomes centered about space utilization. Some sections need further elaboration.

- Perhaps more emphasis should be placed on the effects of local and industry interests working through a Congressman. This action may delay or prevent ARS from closing research locations to better utilize remaining facilities. It is suggested that the following sentence be added to paragraph 1, page ii.
  - As a result, some facilities have been continued in use and research prolonged in subject matter areas that would have been discontinued and the resources redirected to higher priority research.
- The report uses budget figures for Fiscal Years 1981, 1982, and 1983 to show growth but it does not point out that while the dollar amount grew the purchasing power of the dollar declined. It is recommended that the following sentence be inserted after the table on page 1.
  - Despite the increase in dollar resources, ARS has had to reduce staff numbers and research programs because of the decline in purchasing power of the dollar.
- The following paragraph is suggested for insertion following note 'a' on page 6.
  - Increasingly complex research requires costly and complex research equipment and procedures that have very demanding requirements for space. Not uncommonly, isolation from other activities must be provided and the environment carefully controlled. This has brought about the need for more space per scientist. Some locations have taken this into consideration and have adjusted downward the design capacity of existing facilities to be realistic in light of the present research activities. Continued review of space requirements with adjustments to reflect current activities should result in more accurate space utilization data.

[GAO NOTE: The page numbers in USDA's comments have been changed to reflect those in the final report.]

[GAO COMMENT: We considered this condition during our review and, as a result, used the most recent data available. However, the underuse of facilities remains a significant problem.]

- The observation that there are 13 fewer laboratories although ARS has increased its laboratory space is somewhat misleading. The following should be added at the end of the third paragraph under "Congressional Concerns" on page 7.
  - Some of the closed laboratories were inadequate to support the ongoing research. A specific example is Newell, South Dakota (referred to on page 17) where Senate Document 59 recommended that research be terminated. The land that was used for experimentation had been subjected to such a variety of treatments over the past 50 years that research results could no longer be relied upon to provide recommendations on agricultural practices. The buildings were described as meager and seriously inadequate. The additional space at the laboratory at Sidney, Montana remedied this space inadequacy. However, attempts to close out research at Newell, South Dakota and move this program to Sidney, Montana were thwarted for many years by a Senator having a specific interest in this area of the state and closure was not accomplished until that Senator retired. Similar examples can be cited for other locations. In view of these experiences, the recommendation that Congress review and approve plans for laboratory closing is not realistic especially since major closures are built into the Executive Branch budget and are taken up and handled by Congress in the appropriation process. Executive Branch responsibility should be allowed to proceed normally in decisions to close facilities in the course of program administration.

[GAO COMMENT: We do not believe that the statement on p. 7 is somewhat misleading. We are simply pointing out that even though some laboratories were closed, existing laboratories were enlarged and larger laboratories were constructed.]

- It is recommended that the following paragraph follow the cost estimates on page 12.
  - The estimate given for the construction of the Arthropod-Borne Animal Disease Research Center at Fort Collins is a preplan estimate. Estimated cost of construction furnished by the architect is nearly three times the preplan estimate. This increase was partially due to the highly sophisticated research to be conducted and the stringent biological security measures that must be in effect.

- It is stated that many of the facilities constructed over the past 40 years were advocated by the Department. Usually the Department advocated construction of a particular facility to meet major research needs with the expectations that support funds would be provided for the scientific personnel when the facility was completed. The 19 laboratories or facilities involving air, water and soil conservation research are an example. Not all of them were requested by the Department but those requested were based on Senate Document 59 which is a summary of a report prepared for the Committee on Appropriations, United States Senate. To avoid misconception, it is recommended that the following be inserted as an additional paragraph following the first paragraph on page 14.
  - The report contains an assessment of research needs to solve soil, water and air problems existing at that time. Many organizations and individuals contributed to this report. The land-grant colleges and universities from each state had the opportunity to respond. The Bureau of Sport Fisheries and Wildlife, Bureau of Indian Affairs, Bureau of Land Management and Bureau of Reclamation of the U.S. Department of the Interior provided material. Within USDA, the Soil Conservation Service, Forest Service, Agricultural Conservation Program Service, and Agricultural Research Service participated. Public hearings were conducted at 14 locations throughout the United States where over 700 individuals presented oral or written comments. Construction requests from the Department were to implement the recommendations of this report in an orderly manner.
- An implication is made that obtaining scientific services through cooperative agreements is to avoid personnel ceilings. It is suggested that the first word of paragraph 2, page 19 be changed to "Occasionally" and the following sentence added to the paragraph.
  - However, the major use of cooperative agreements has been to obtain scientific expertise in situations where a particular expertise is needed for a relatively short time period--one to three years--and it was improbable that a career appointment would result in effective, long term utilization of a scientists special talents.

[GAO COMMENT: As discussed on p. 19, most of the personnel hired under cooperative agreements at the laboratories we visited were support personnel, such as laboratory technicians and farm workers, not scientists.]

- Recognition that some space is utilized by sister agencies such as the Animal and Plant Health Inspection Service (APHIS) is appropriate and should probably be expanded. On page 21, second paragraph adding the following sentence seems appropriate.
  - This sharing of facilities improves communication among the scientists and enables both agencies to carry out their role and mission more effectively.

- The summary reports 17 percent as the lowest facility utilization rate but the lowest reported rate in the text appears to be at Madison, Wisconsin with a utilization rate of 29 percent. (page 4)

[GAO COMMENT: The Madison, Wisconsin, facility had the lowest use rate of the laboratories we visited, but the Federal Experiment Station, St. Croix, Virgin Islands, had a use rate of 17 percent.]

- In the past, many new facilities were fully staffed, but due to inflation the number of employees have had to be reduced to the detriment of the research effort. More recently OMB has not granted the necessary personnel slots for staffing nor has Congress always followed through with the necessary appropriations for funding operations.
- Figures showing ARS occupancy and total occupancy seem to imply that all non-ARS personnel are non-Federal. It may be appropriate to indicate how many non-ARS Federal people occupy the facilities. As pointed out earlier, the joint usage by sister agencies often proves highly beneficial to both agencies. (page 6)

[GAO COMMENT: We acknowledge throughout the report that some of the non-ARS personnel work for other Federal agencies. (See p. 20 as an example.) However, figures were not readily available for the table on p. 6 to show how many non-ARS personnel work for other Federal agencies.]

- Although the report identifies the activity of various special interest groups with respect to closing out research locations, no mention is made of the need for Congressional support for ARS's management efforts to improve space utilization by closure of selected locations. (page 18)

[GAO NOTE: See discussion in Chapter 4.]

- ARS is presently developing a Strategic Plan to use as a basis for future research management. The implementation plan and operational plan that support the strategic plan should be an excellent basis for the Secretary of Agriculture to assure consolidation of research and permit greater scientist interaction for more efficient use of equipment, facilities, and administrative resources. (page 32)

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